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NEWS

Near-term climate prediction ‘coming of age’

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Bridging the gap between shorter-term seasonal forecasts and long-term climate projections has long been a dream of climate scientists.

Now a review paper, published by a team of international climate scientists, and led by authors at the Met Office and the Lamont-Doherty Earth Institute, validates the capability for near-term climate predictions out to a few years ahead.

These predictions are expected to become increasingly useful for society, for government and business planning. And they have the potential to provide increasing resilience to communities at useful timescales for planning. Many societal decisions, such as flood and drought management and international disaster risk reduction, need to be made on timescales best served by near-term climate predictions.

The paper published in the journal Nature Climate Change shows the prospects for skilful near-term climate predictions when climate models are started from real-time observations of both the ocean and the atmosphere. These coupled ocean-atmosphere climate models also incorporate the effects of anthropogenic greenhouse gases and natural effects, such as solar variability on climate.

Professor Adam Scaife is a lead author on the study at the Met Office and Professor of Applied Mathematics at the University of Exeter. He said: “The science of near-term climate prediction is developing rapidly, following in the footsteps of weather forecasting, which has made enormous progress since the 1950s. Our research highlights significant skill in these predictions when tested against past climate variations and calls for regular, internationally coordinated predictions to be made.”

Yochanan Kushnir of the Lamont-Doherty Earth Observatory, at Colombia University, said: “Our paper promotes the move of near-term climate prediction from the experimental state to the practical application for the 21st century decision makers. We are convinced that with proper delivery and coaching, users of the operational product will be able to utilize this information effectively for long-term planning in a broad range of economic sectors. And, importantly, for increasing society’s resilience to climate variability and change.”

Developing countries, for example in sub-Saharan Africa, are expected to benefit increasingly from the boost in near-term climate prediction.

Near-term climate prediction is listed as one of the Grand Challenges of the World Climate Research Programme, an international programme helping to co-ordinate global climate research. Pavel Kabat, the World Meteorological Organization's Chief Scientist and Director of Research, said: “Climate predictions at decadal time scales are produced routinely now to international standards, allowing this nascent field to develop further and to adapt to society's needs. This achievement is an outstanding example of long-standing science investment and ongoing collaboration between entities such as the World Climate Research Programme and international partners in research and national prediction centers.”

The authors' study shows prospects for skilful near-term prediction when coupled climate model simulations – including those representing both the atmosphere and the oceans – are initialised using observations from the current climate. These are further improved when incorporating the influences from human-induced climate change and natural drivers, such as solar radiation. Prof Scaife added: "An exciting prospect is that the skill of these predictions a few years ahead is similar to the skill of seasonal predictions a few months ahead, which are already widely used for planning aid and disaster risk reduction."

Francisco J. Doblas-Reyes, ICREA professor at the Earth Sciences Department of the Barcelona Supercomputing Center (BSC) said: "The time-critical aspects of real-time decadal climate prediction are now well addressed, becoming a new source of reliable climate information for relevant socio-economic sectors."

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